

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-3, 9-13, 20-22, 28 and 32 are presently active in this application, Claims 1, 2, 9 and 32 have been amended by the present amendment, and Claims 4-8, 14-19, 23-27 and 29-31 previously canceled.

In the outstanding Office Action Claims 1, 2, 9 and 32 were rejected under 35 USC §101 and Claims 1-3, 9-13, 20-22, 28 and 32 were indicated as containing allowable subject matter.

In response to the outstanding rejection, Claims 1, 2, 9 and 32 have been amended to emphasize the computer implemented aspects of the present invention whereby the claimed invention is clearly not claimed in the abstract, consistent with case law.

Turning now to the case law, the controlling precedent is *State Street Bank Trust Co. v. Signature Financial Group Inc.*, 47 USPQ2d 1596, 1600-1602 (Fed. Cir. 1998). The Federal Circuit, in *State Street*, stated:

The "Mathematical Algorithm" Exception

The Supreme Court has identified three categories of subject matter that are unpatentable, namely "laws of nature, natural phenomena, and abstract ideas." *Diehr*, 450 U.S. at 185. Of particular relevance to this case, the Court has held that mathematical algorithms are not patentable subject matter to the extent that they are merely abstract ideas. See *Diehr*, 450 U.S. 175 [209 USPQ 1], *passim*; *Parker v. Flook*, 437 U.S. 584 [198 USPQ 193] (1978); *Gottschalk v. Benson*, 409 U.S. 63 [175 USPQ 548] (1972). In *Diehr*, the Court explained that certain types of mathematical subject matter, standing alone, represent nothing more than abstract ideas until reduced to some type of practical application, i.e., "a useful, concrete and tangible result." *Alappat*, 33 F.3d at 1544, 31 USPQ2d at 1557.

Unpatentable mathematical algorithms are identifiable by showing they are merely abstract ideas constituting disembodied concepts or truths that

are not "useful." From a practical standpoint, this means that to be patentable an algorithm must be applied in a "useful" way. In *Alappat*, we held that data, transformed by a machine through a series of mathematical calculations to produce a smooth waveform display on a rasterizer monitor, constituted a practical application of an abstract idea (a mathematical algorithm, formula, or calculation), because it produced "a useful, concrete and tangible result"--the smooth waveform.

Similarly, in *Arrhythmia Research Technology Inc. v. Corazonix Corp.*, 958 F.2d 1053, 22 USPQ2d 1033 (Fed. Cir. 1992), we held that the transformation of electrocardiograph signals from a patient's heartbeat by a machine through a series of mathematical calculations constituted a practical application of an abstract idea (a mathematical algorithm, formula, or calculation), because it corresponded to a useful, concrete or tangible thing -- the condition of a patient's heart.

Today, we hold that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces "a useful, concrete and tangible result"--a final share price momentarily fixed for recording and reporting purposes and even accepted and relied upon by regulatory authorities and in subsequent trades.

The district court erred by applying the Freeman-Walter-Abele test to determine whether the claimed subject matter was an unpatentable abstract idea. The Freeman-Walter-Abele test was designed by the Court of Customs and Patent Appeals, and subsequently adopted by this court, to extract and identify unpatentable mathematical algorithms in the aftermath of *Benson* and *Flook*. See *In re Freeman*, 573 F.2d 1237, 197 USPQ 464 (CCPA 1978) as modified by *In re Walter*, 618 F.2d 758, 205 USPQ 397 (CCPA 1980). The test has been thus articulated:

First, the claim is analyzed to determine whether a mathematical algorithm is directly or indirectly recited. Next, if a mathematical algorithm is found, the claim as a whole is further analyzed to determine whether the algorithm is "applied in any manner to physical elements or process steps," and, if it is, it "passes muster under Section 101." *In re Pardo*, 684 F.2d 912, 915, 214 USPQ 673, 675-76 (CCPA 1982) (citing *In re Abele*, 684 F.2d 902, 214 USPQ 682 (CCPA 1982)).

After *Diehr* and *Chakrabarty*, the Freeman-Walter-Abele test has little, if any, applicability to determining the presence of statutory subject matter. As we pointed out in *Alappat*, 33 F.3d at 1543, 31 USPQ2d at 1557, application of the test could be misleading, because a process, machine, manufacture, or composition of matter employing a law of nature, natural phenomenon, or abstract idea is patentable subject matter even though a law

of nature, natural phenomenon, or abstract idea would not, by itself, be entitled to such protection. The test determines the presence of, for example, an algorithm. Under Benson, this may have been a sufficient indicium of nonstatutory subject matter. **However, after Diehr and Alappat, the mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it nonstatutory subject matter, unless, of course, its operation does not produce a "useful, concrete and tangible result."** Alappat, 33 F.3d at 1544, 31 USPQ2d at 1557. 7 After all, as we have repeatedly stated, every step-by-step process, be it electronic or chemical or mechanical, involves an algorithm in the broad sense of the term. Since Section 101 expressly includes processes as a category of inventions which may be patented and Section 100(b) further defines the word "process" as meaning "process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material," it follows that it is no ground for holding a claim is directed to nonstatutory subject matter to say it includes or is directed to an algorithm. This is why the proscription against patenting has been limited to *mathematical* algorithms. . . . In re Iwahashi, 888 F.2d 1370, 1374, 12 USPQ2d 1908, 1911 (Fed. Cir. 1989) (emphasis in the original).

The question of whether a claim encompasses statutory subject matter should not focus on which of the four categories of subject matter a claim is directed to -- process, machine, manufacture, or composition of matter--but rather on the essential characteristics of the subject matter, in particular, its practical utility. Section 101 specifies that statutory subject matter must also satisfy the other "conditions and requirements" of Title 35, including novelty, nonobviousness, and adequacy of disclosure and notice. See In re Warmerdam, 33 F.3d 1354, 1359, 31 USPQ2d 1754, 1757-58 (Fed. Cir. 1994). **For purpose of our analysis, as noted above, claim 1 is directed to a machine programmed with the Hub and Spoke software and admittedly produces a "useful, concrete, and tangible result."** Alappat, 33 F.3d at 1544, 31 USPQ2d at 1557. This renders it statutory subject matter, even if the useful result is expressed in numbers, such as price, profit, percentage, cost, or loss. (Emphasis in bold added)

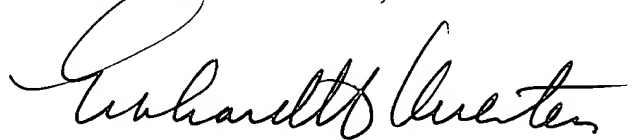
State Street Bank, supra, then has expounded on the holdings of *Diamond v. Diehr*, 450 U.S. 175, 182 [209 USPQ 1] (1981) and *In re Alappat*, 33 F.3d 1526, 1540-41, 31 USPQ2d 1545, 1554 (Fed. Cir. 1994) (*in banc*), to establish clearly the modern test for statutory subject matter on the basis of whether the claimed invention "produces a "useful, concrete and tangible result." Under this test, whether or not the result produced by a claimed invention is a number, or a code, is in no way dispositive.

In considering the *State Street* test in regard to the present claims, it is relevant that, as evident from the background of the invention described in the specification, there exists a persistent problem in the prior art of code embedding and detecting as to how to embed code information which is resistant to collusion attacks and in which it is possible to ameliorate deterioration of the quality of contents even if the total number of users or colluders is large. Applicants' invention represents an improvement in code embedding and detecting by which resistance to collusion attacks is improved and deterioration of contents quality is ameliorated. The code produced by the method of Claim 1 is "useful, concrete and tangible result" responsive to the problems of the prior art. Likewise the code generating units of Claims 2 and 9 have distinct structural components, as claimed, and likewise produce "useful, concrete and tangible result," i.e., a code to be embedded. That being the case, it is respectfully submitted that the claimed invention meets the *State Street*, supra, test for statutory subject matter and indeed is statutory under 35 U.S.C. §101.

Accordingly, it is respectfully submitted that the outstanding rejection under 35 U.S.C. §101 is traversed and the present application is in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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